

HeinOnline and Law Review Citation Patterns*

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The authors tested the proposition that the ubiquity of HeinOnline in law libraries would alter law review citation patterns. Has HeinOnline’s provision of the full runs of law reviews in full text led to more citations to older materials? This article reports the results of the study they undertook to test this theory.

Introduction55

A Brief History of Law Review Searching.....56

Journal Citation Patterns57

Has Law Journal Availability on HeinOnline Affected Citation Patterns?.....60

 Methodology.....60

 Results61

 Analysis of Results65

Conclusion67

Introduction

¶1 Computer-assisted legal research (CALR), first developed in the 1960s, was introduced to users via several commercial options in the 1970s and was in wide-spread use by the 1980s.¹ As CALR spread, librarians and lawyers began assessing the ways in which CALR would change legal research, and perhaps even the legal profession as a whole.² As this revolution has progressed from dedicated computer terminals to the web, both change, and discussion of its significance, seem inevitable.³

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1. For a fuller discussion of the early years of computer-assisted legal research and its increasing use, see William G. Harrington, *A Brief History of Computer-Assisted Legal Research*, 77 LAW LIBR. J. 543 (1984–1985); and John R. Johnson & Jo McDermott, *Days of Miracle and Wonder: A Retrospective and Future Look at Computer-Assisted Legal Research*, 19 W. ST. U. L. REV. 525 (1992).

2. See, e.g., Mathew F. Dee & Ruth M. Kessler, *Impact of Computerized Methods on Legal Research Courses: A Survey of LEXIS Experience and Some Probable Effects of WESTLAW*, 69 LAW LIBR. J. 164 (1976); Jack A. Hiller, *Comes the Revolution*, 51 A.B.A. J. 257 (1965); Laura A. O’Connell, *Legal Malpractice: Does the Lawyer Have a Duty to Use Computerized Research?*, 35 FED’N INS. COUNS. Q. 77 (1984).

3. For a recent example of this discussion, see Katrina Fischer Kuh, *Electronically Manufactured Law*, 22 HARV. J.L. & TECH. 223 (2008).

¶2 This article explores one narrow change in the legal research landscape: electronic access to older law review articles via HeinOnline. Has the rate of law review citations to older law review articles increased since the introduction of HeinOnline? Before directly addressing this question, it is useful to look at the history of computer-assisted legal research as it applies to legal periodicals. Due to the nature of this study, the history reported here focuses on the changes in availability of pre-1980s articles.

A Brief History of Law Review Searching

¶3 The print *Index to Legal Periodicals* (ILP) began publication in 1908, and for decades provided the only comprehensive author and subject access to U.S. law review articles.⁴ When CALR first appeared in the 1960s and '70s, it offered only primary sources.⁵ In 1980, the *Current Law Index* (CLI), a competitor to ILP, arrived, offering options in both print and microfilm.⁶ Starting with the 1982 issues, Lexis and Westlaw began providing full-text, nonindexed access to legal periodicals.⁷ Since the 1980s, ILP and CLI (as Legal Resource Index or LegalTrac) have offered access through an evolution of electronic platforms, including laser-discs, CD-ROMs, tape loads, online services, and the web.⁸

¶4 Electronic search tools offered significant advances over print indexes, including the ability to search multiple years of articles simultaneously and to customize searches, accessing materials by terms beyond prescribed subject headings. For the most part, though, searching for articles published earlier than the 1980s still required the use of the print ILP. That changed at the beginning of the twenty-first century, starting with the launch of HeinOnline in mid-2000.⁹ By 2001, HeinOnline offered online access to the full text of articles from about ninety legal journals back to their first volumes, with plans to extend access to another one hundred journal titles.¹⁰ Law librarians took notice, and the American Association of Law Libraries (AALL) recognized HeinOnline with its New Product Award for 2001.¹¹ In 2004, ILP began providing retrospective coverage electronically, offering a database containing the index back to 1918 and an OpenURL link resolver to allow users to move readily from an index entry to an electronic version of the

4. John Hasko, *ILP and Legal Periodicals—The Electronic Evolution*, ADVOCATE (IDAHO), Sept. 2006, at 39.

5. Howard A. Hood, *Disk and DAT: Recent Developments in Legal Databases and Emerging Information Technologies in the United States*, 15 INT'L J. LEGAL INFO. 109, 112 (1987).

6. Hasko, *supra* note 4, at 39.

7. Hood, *supra* note 5, at 112.

8. Laura Peritore, *LEGALTRAC and WILSONDISC: A Comparison*, LEGAL REFERENCE SERVICES Q., nos. 3/4, 1988, at 233; Nina Platt, *Legal Periodical Indexes on the Web*, DATABASE MAG., Oct. 1998, at 44.

9. *About HeinOnline: Brief History*, HEINONLINE, http://heinonline.org/home/about/Brief_History.html (last visited Oct. 7, 2010).

10. John Hasko, *Electronic Law Journals—Hein-On-Line*, ADVOCATE (IDAHO), Sept. 2001, at 30.

11. *New Product Award: Previous Winners*, AM. ASS'N OF LAW LIBRARIES, http://www.aallnet.org/about/award_best.asp#winners (last visited Oct. 7, 2010).

article through a full-text provider, such as HeinOnline.¹² By mid-2006, electronic ILP coverage had been expanded back to the index's 1908 inception.¹³

¶5 These changes greatly benefited legal researchers interested in locating law review articles published prior to the 1980s. Like newer law review articles, older articles could now be identified, and often obtained in full text, without leaving the computer. Given this history, we wondered if the greater ease with which older journal articles could be accessed represented more than a time savings for researchers. Had it actually influenced citation patterns, encouraging authors to incorporate additional older references into their articles?

Journal Citation Patterns

¶6 Many have sought to learn about disciplines through bibliometric analysis of citation patterns.¹⁴ Such studies help paint a picture of a discipline's literature and research standards through various distributions of the cited sources, such as type, age, language, and number of authors. The data may be further analyzed: for example, to see if core sources can be identified.

¶7 One of the most common types of bibliometric studies of law reviews attempts to rank the influence of these materials, typically by considering frequency or other analysis of citations in scholarship or court opinions. Some look at specific journal titles,¹⁵ others at specific articles.¹⁶ The ranking systems themselves, along

12. Press Release, Now on Wilson Web: Index to Legal Periodicals Retrospective 1918–1981 (Aug. 26, 2004), http://www.hwwilson.com/news/news_8_26_04.htm. Interestingly, in a 1998 article, Richard Leiter noted:

The author has been engaging in a one-person campaign to convince the H.W. Wilson Company of the value of publishing a retrospective database in electronic format of the *Index to Legal Periodicals*. To date, all arguments have been met only with raised eyebrows and wonderment. At this point in time, it appears that such a product may never be developed.

Richard A. Leiter, *Use of Law Reviews in Modern Legal Research: The Computer Didn't Make Me Do It!*, 90 LAW LIBR. J. 59, 68 n.12 (1998). Fortunately, it took only six years for H.W. Wilson to see the light.

13. Hasko, *supra* note 4, at 39.

14. See, e.g., James C. Baughman, *A Structural Analysis of the Literature of Sociology*, 44 LIBR. Q. 293 (1974); William C. Baum et al., *American Political Science Before the Mirror: What Our Journals Reveal About the Profession*, 38 J. POL. 895 (1976); Robert N. Broadus, *An Analysis of Literature Cited in the American Sociological Review*, 17 AM. SOC. REV. 355 (1952); Richard Heinzkill, *Characteristics of References in Selected Scholarly English Literary Journals*, 50 LIBR. Q. 352 (1980); Lina Ortega, *Age of References in Chemistry Articles: A Study of Local Authors' Publications from Selected Years, 1975–2005*, 28 SCI. & TECH. LIBR. 209 (2008).

15. See, e.g., Ronen Perry, *The Relative Value of American Law Reviews: Refinement and Implementation*, 39 CONN. L. REV. 1 (2006); *Law Journals: Submissions and Rankings: Methodology*, WASH. & LEE UNIV. SCH. OF LAW, <http://lawlib.wlu.edu/LJ/method.asp> (last visited Oct. 7, 2010). Perhaps the earliest published law review bibliometrics come from Douglas Maggs, who provided detailed tables of the law review articles cited in published court opinions over a period of five to forty-eight months, depending on the court, in an appendix to his article discussing the general value of law reviews. Douglas B. Maggs, *Concerning the Extent to Which the Law Review Contributes to the Development of the Law*, 3 S. CAL. L. REV. 181 (1930). The data can be viewed by type of material cited, citing jurisdiction, citing judge, cited law reviews, citing case, and leading cited article, note, and book reviews. *Id.* at 191–204. Despite this wealth of data and access points, Maggs prefaces the appendix with this note: “The tables which follow do little more than show that law reviews are being cited to some extent by the courts. Whether the demonstration of this fact justifies the tedious paging of reports by an assistant, which was necessary to assemble the data, may well be doubted.” *Id.* at 191.

16. See, e.g., James Leonard, *Seen' the Cites: A Guided Tour of Citation Patterns in Recent American*

with the concept that citation frequency is a measure of quality, have also been discussed and evaluated.¹⁷

¶8 Within this genre, some authors have empirically assessed what makes articles more likely to be heavily cited. They have identified a significant number of variables that affect the likelihood of citation, including (but not limited to) article subject,¹⁸ jurisdiction,¹⁹ placement in a symposium,²⁰ publisher,²¹ the author's sex or race,²² and the author's legal education credentials.²³

¶9 Several bibliometric studies of law journals have pointed to the effects of the characteristic most relevant for this study, article age. A study of citations in all journals indexed by the November 1972 ILP found that law journal articles are much more likely to cite to recent articles. Thirty-three percent of citations were to articles not more than two years old, 24% to three-to-five-year-old articles, 19% to six-to-ten-year-old articles, 15% to eleven-to-twenty-year-old articles, and 9% to articles over twenty years old.²⁴

¶10 Similar results were found a decade later, in a study analyzing the citations of 211 academic law review articles randomly selected from among those published in 1986.²⁵ In the first five years after publication, an article received about twice as many citations as it did in the next five-year period, six to ten years after publication. Articles received eighty-seven percent of their citations within twenty years of being published.²⁶

Law Review Articles, 34 ST. LOUIS U. L.J. 181 (1990); Fred R. Shapiro, *The Most-Cited Law Review Articles*, 73 CAL. L. REV. 1540 (1985); Fred R. Shapiro, *The Most-Cited Law Review Articles Revisited*, 71 CHI.-KENT L. REV. 751 (1996). *But see* William M. Landes & Richard A. Posner, *Heavily Cited Articles in Law*, 71 CHI.-KENT L. REV. 825, 827 (1996) (critiquing Shapiro's citation ranking methodology of examining citations to a single journal article while ignoring the cumulative number of citations to many individual works by one scholar).

17. See, e.g., Arthur Austin, *The Reliability of Citation Counts in Judgments on Promotion, Tenure, and Status*, 35 ARIZ. L. REV. 829 (1993); Russell Korobkin, *Ranking Journals: Some Thoughts on Theory and Methodology*, 26 FLA. ST. U. L. REV. 851 (1999); Ronen Perry, *The Relative Value of American Law Reviews: A Critical Appraisal of Ranking Methods*, 11 VA. J.L. & TECH. 1 (2006).

18. Ian Ayers & Frederick E. Vars, *Determinants of Citations to Articles in Elite Law Reviews*, 29 J. LEGAL STUD. 427, 437–39 (2000) (indicating that the topics of “jurisprudence and feminism or Critical Legal Studies” received more citations than average, whereas articles in criminal and international law were cited fewer times than average).

19. Scott DeLeve, *A Comparative Citation Analysis of Seven Mid-South Law Reviews*, LEGAL REFERENCE SERVICES Q., Oct. 2003, at 107 (noting that articles of a national scope were cited significantly more than state-specific pieces).

20. *Id.* (noting that articles in a symposium issue were cited more on average than articles published in a nonsymposium issue).

21. Richard A. Mann, *The Use of Legal Periodicals by Courts and Journals*, 26 JURIMETRICS J. 400, 415 (1986) (finding that articles in non-law school journals were cited more on average than articles in law school journals).

22. Ayers & Vars, *supra* note 18, at 439 (reporting that, on average, articles by women receive more citations than articles by men, and articles by authors of color receive more citations than articles by white authors).

23. Leonard, *supra* note 16, at 196–201 (finding that authors with law degrees from top-ranked law schools were more frequently cited).

24. Olavi Maru, *Measuring the Impact of Legal Periodicals*, 1976 AM. B. FOUND. RES. J. 227, 247.

25. Leonard, *supra* note 16, at 188.

26. *Id.* at 205.

¶11 A more recent study considered 979 articles published in the *Harvard Law Review*, *Stanford Law Review*, and *Yale Law Journal* between 1980 and 1995.²⁷ The data were adjusted for a number of author and article characteristics and supported the proposition that the number of citations to an article would rise quickly after its publication, peak, and then wane. The peak was about four years after an article's publication; the number of citations an article has received 4.5 years after its initial publication represents about half of the total citations it will receive.²⁸

¶12 Mixed results have been reported on the ways in which widespread use of CALR has affected the rate of law review citations to older articles. In a study similar to ours, Richard Leiter analyzed article citations from 1976 (before the introduction of computers) and 1996 (after the introduction of computers) and found that regardless of access to computers, authors primarily cited to relatively recent material.²⁹ Material older than sixteen years was cited at a much lower rate. The statistics for 1996 and 1976 were nearly identical. In 1996, material sixteen or fewer years old represented 73% of citations while older material accounted for 27% of citations.³⁰ In 1976, those percentages were 72% and 28%, respectively.³¹ Regarding the implications for the print library collection, Leiter reached a "glass half-full" conclusion that because almost 30% of cited articles were from before 1980, libraries have a powerful reason to retain print journal collections.³² Lower usage does not mean the materials are unimportant.

¶13 Two more recent studies have documented that the ease of access provided by CALR has increased citations to law reviews. For example, John Joergensen found that when the full text of second-tier law reviews was included in LexisNexis and Westlaw, those journals were cited more frequently.³³ This indicated that researchers' reliance on Westlaw and LexisNexis was increasing and that online availability boded favorably for a journal's visibility and use.³⁴ However, unlike Leiter, Joergensen concluded that print collections were not cost-effective because users rely less heavily on them.³⁵

¶14 Recently, Mary Rumsey looked at this issue with regard to international law journals.³⁶ She began with the hypothesis that the increase in journals available in electronic format has resulted in authors increasingly citing to journals, rather than books. She analyzed citations in the *American Journal of International Law* from 1982, 1992, and 2005 and found that in 1982 and 1992 a majority of citations (61.75% and 57.7% respectively) were to books.³⁷ However, the opposite was true

27. Ayers & Vars, *supra* note 18, at 427.

28. *Id.* at 436–37.

29. Leiter, *supra* note 12, at 60–61.

30. *Id.* at 65 tbl.2.

31. *Id.*

32. *Id.* at 69.

33. John P. Joergensen, *Second Tier Law Reviews, Lexis and Westlaw: A Pattern of Increasing Use*, LEGAL REFERENCE SERVICES Q., Jan. 2002, at 43.

34. *Id.* at 52.

35. *Id.* at 53.

36. Mary Rumsey, *Gauging the Impact of Online Legal Information on International Law: Two Tests*, 35 SYRACUSE J. INT'L L. & COM. 201 (2008).

37. *Id.* at 210.

in 2005: 59.1% of the citations were now to journal articles.³⁸ After noting that in the same period the proportion of journal articles published on international law—as compared to books on the same subject—had risen by only 3%, she concluded that the increased availability of electronic articles had indeed affected citation patterns.³⁹

Has Law Journal Availability on HeinOnline Affected Citation Patterns?

Methodology

¶15 To determine whether the rate of law review citations to older law review articles has increased since the introduction of HeinOnline, we compared the number and age of the citations to articles published in twenty journals in two different years, 1998 and 2008. These years were selected to try to capture two distinctly different periods for researching law review articles. In both years, Westlaw and LexisNexis journal databases were in widespread use. However, 1998 predates the launch of HeinOnline, while it was ubiquitous at American law school libraries by 2008,⁴⁰ thus permitting a reasonable evaluation of the influence HeinOnline might have had on citation patterns.

¶16 In determining which journals to sample, we considered three key characteristics: publication history, availability, and reach. To provide ample opportunity for citation to older articles, selected journals needed to have a significant backrun, beginning publication no later than the 1950s. The complete run of the journal (minus new content, which is sometimes embargoed) had to be available in HeinOnline, with LexisNexis/Westlaw coverage beginning no earlier than the 1980s. To further increase the likelihood of gathering a significant sample of citations to a given journal in a given year, we also selected titles from among the more heavily cited law reviews. Three major law review ranking systems (from Washington & Lee;⁴¹ the *Connecticut Law Review*;⁴² and HeinOnline⁴³) were consulted to assess journal reach. Twenty journals that appeared on all three lists and met the other criteria were chosen for evaluation.

¶17 The selected journals (in alphabetical order) were *American University Law Review*, *Boston University Law Review*, *Cornell Law Review*, *Duke Law Journal*, *Emory Law Journal*, *Florida Law Review*, *Fordham Law Review*, *Georgetown Law Journal*, *Hastings Law Journal*, *Indiana Law Journal*, *Iowa Law Review*, *Michigan Law Review*, *Minnesota Law Review*, *Northwestern University Law Review*, *Notre*

38. *Id.*

39. *Id.* at 210–11.

40. E-mail from Marcie Baranich, Marketing Manager, William S. Hein & Co., to Karen L. Wallace (May 11, 2010, 10:55 A.M. CST) (on file with authors) (confirming that at the beginning of 2007, every ABA-approved law school subscribed to HeinOnline).

41. *Law Journals: Submissions and Ranking*, WASH. & LEE UNIV. SCH. OF LAW, <http://lawlib.wlu.edu/lj/> (last visited Oct. 7, 2010).

42. Perry, *supra* note 15, at 19–25.

43. *Most-Cited Law Journals*, HEINONLINE, <http://heinonline.org/HOL/Index?collection=top30> (last visited Oct. 7, 2010).

Dame Law Review, *UCLA Law Review*, *University of Chicago Law Review*, *Vanderbilt Law Review*, *William & Mary Law Review*, and *Wisconsin Law Review*.⁴⁴

¶18 The Westlaw Journals and Law Reviews (JLR) database was then searched to identify every time these journals were cited in any law review article published in 1998 or 2008. We began by searching for journal titles as they would be cited by the *Bluebook*⁴⁵ or *ALWD Manual*⁴⁶ and discovered that phrase searching omitted many valuable references. Westlaw customer service advised us to use proximity searches rather than phrase searches. Using the *Iowa Law Review* as an example, two sample search strings were **te(iowa +2 l.rev.)(iowa +2 l. +2 rev.) & da(1998)** and **te(iowa +2 l.rev.)(iowa +2 l. +2 rev.) & da(2008)**.

¶19 The data were then analyzed to determine how often material from each decade was cited. Looking at the data for each journal and publication year separately, each citation was individually noted by decade (1920–1929, 1930–1939, etc.).⁴⁷ The results were then tallied to determine what percentage of the citations came from each decade. Table 1 shows the number and percentage of citations for each journal from each decade.

Results

¶20 Overall, there were 60,141 citations to the twenty selected journals, of which 26,548 were from 1998 and 33,593 were from 2008. To try to assess a HeinOnline effect independent of Westlaw and LexisNexis, we considered the publication date when the researcher would have had to access articles either via HeinOnline or in print because they would not have been available on LexisNexis or Westlaw. For 2008 articles, we had to go back three decades, classifying articles published in 1979 or earlier as “older.”⁴⁸ To ensure we compared articles of the same relative age, we also had to go back three decades for the 1998 articles; in this case the “older” articles were published in 1969 or earlier. In both cases, the group of newer articles included all those published less than thirty years from the test date of 2008 or 1998, and the group of older articles included all those published thirty or more years earlier than the test date. Of the 1998 citations, 94% were published fewer than thirty years earlier, while only 6% were thirty or more years old. The pattern was virtually unchanged in 2008: 93% less than and 7% equal to or more than thirty years old.

¶21 Individual citation patterns, as shown in table 2, varied, with the split between older/newer citation percentages ranging from 1%/99% for the 1998 *American University Law Review*, to 14%/86% for the 2008 *Minnesota Law Review*. However, when comparing the same journal title for the two years, the rates were

44. Coverage information on all journals is included in the appendix.

45. THE BLUEBOOK: A UNIFORM SYSTEM OF CITATION (19th ed. 2010).

46. ASS'N OF LEGAL WRITING DIRS. & DARBY DICKERSON, ALWD CITATION MANUAL: A PROFESSIONAL SYSTEM OF CITATION (4th ed. 2010).

47. Multiple citations within one article to a single article were counted only once.

48. For both 2008 and 1998, our most recent decade included only nine years—i.e., for the 2000s we counted only citations from 2000 to 2008. In both cases, the preceding decades included the full ten years—i.e., for 2008 articles, citations from the 1990s included articles published from 1990 to 1999.

Table 1
Citations per Decade in Articles from 1998 and 2008

Journal Name/Year	Total Number of Citations	Age																	
		No. from 2000s	% from 1990s	No. from 1990s	% from 1990s	No. from 1980s	% from 1970s	No. from 1960s	% from 1960s	No. from 1950s	% from 1950s	No. from 1940s	% from 1940s	No. from 1930s	% from 1930s	No. from 1920s	% from 1920s	No. from 1910s	% from 1900s
Am. U. L. Rev./1998	684			590	86.26	75	10.96	15	2.19	4	0.58	0	0.00						
Am. U. L. Rev./2008	873	417	47.77	314	35.97	119	13.63	21	2.41	1	0.11	1	0.11						
B.U. L. Rev./1998	806			463	57.44	269	33.37	47	5.83	6	0.74	5	0.62	12	1.49	1	0.12		
B.U. L. Rev./2008	1222	670	54.83	299	24.47	198	16.20	28	2.29	5	0.41	6	0.49	6	0.49	3	0.25		
Cornell L. Rev./1998	1782			1065	59.76	438	24.58	134	7.52	44	2.47	17	0.95	13	0.73	53	2.97	4	0.22
Cornell L. Rev./2008	2015	935	46.40	590	29.28	293	14.54	57	2.83	20	0.99	21	1.04	26	1.29	58	2.88	4	0.20
Duke L.J./1998	1425			905	63.51	417	29.26	64	4.49	36	2.53	3	0.21						
Duke L.J./2008	1868	845	45.24	644	34.48	297	15.90	57	3.05	20	1.07	5	0.27						
Emory L.J./1998	874			613	70.14	200	22.88	28	3.20	14	1.60	19	2.17						
Emory L.J./2008	1176	706	60.03	315	26.79	103	8.76	10	0.85	15	1.28	27	2.30						
Fla. L. Rev./1998	355			218	61.41	104	29.30	13	3.66	14	3.94	5	1.41	1	0.28				
Fla. L. Rev./2008	624	425	68.11	130	20.83	48	7.69	9	1.44	5	0.80	6	0.96	1	0.16				
Fordham L. Rev./1998	1471			1205	81.92	192	13.05	47	3.20	14	0.95	5	0.34	4	0.27				
Fordham L. Rev./2008	2042	1298	63.57	564	27.62	121	5.93	32	1.57	4	0.20	6	0.29	5	0.24	12		0	0.00
Geo L.J./1998	2001			1453	72.61	380	18.99	80	4.00	49	2.45	5	0.25	11	0.55	14	0.70	9	0.45
Geo L.J./2008	2260	1266	56.02	676	29.91	230	10.18	36	1.59	15	0.66	8	0.35	12	0.53	11	0.49	6	0.27
Hastings L.J./1998	992			677	68.25	218	21.98	74	7.46	18	1.81	5	0.50	0	0.00				
Hastings L.J./2008	1207	559	46.31	420	34.80	153	12.68	65	5.39	5	0.41	4	0.33	1	0.08				

Journal Name/Year	Total Number of Citations	Age																No. from 2000s	% from 2000s	No. from 1990s	% from 1990s	No. from 1980s	% from 1980s	No. from 1970s	% from 1970s	No. from 1960s	% from 1960s	No. from 1950s	% from 1950s	No. from 1940s	% from 1940s	No. from 1930s	% from 1930s	No. from 1920s	% from 1920s	No. from 1910s	% from 1910s	No. from 1900s	% from 1900s																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Ind. L.J./1998	928			612	65.95	175	18.86	97	10.45	14	1.51	18	1.94	5	0.54	4	0.43	3	0.32																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

Table 2

Percentage of Citations Thirty Years or Older: 1998 and 2008

Journal Name/Year	Total Number of Citations	Citations to Materials from Previous 30 Years		Citations to Materials More Than 30 Years Old	
		Number of Citations	Percentage	Number of Citations	Percentage
Total 1998	26,548	24,959	94%	1589	6%
Total 2008	33,593	31,092	93%	2501	7%
Am. U. L. Rev./1998	684	680	99%	4	1%
Am. U. L. Rev./2008	873	850	97%	23	3%
B.U. L. Rev./1998	806	779	97%	27	3%
B.U. L. Rev./2008	1222	1167	95%	55	5%
Cornell L. Rev./1998	1782	1637	92%	145	8%
Cornell L. Rev./2008	2015	1818	90%	197	10%
Duke L.J./1998	1425	1386	97%	39	3%
Duke L.J./2008	1868	1786	96%	82	4%
Emory L.J./1998	874	841	96%	33	4%
Emory L.J./2008	1176	1124	96%	52	4%
Fla. L. Rev./1998	355	335	94%	20	6%
Fla. L. Rev./2008	624	603	97%	21	3%
Fordham L. Rev./1998	1471	1444	98%	27	2%
Fordham L. Rev./2008	2042	1983	97%	59	3%
Geo L.J./1998	2001	1319	96%	88	4%
Geo L.J./2008	2260	2172	96%	88	4%
Hastings L.J./1998	992	969	98%	23	2%
Hastings L.J./2008	1207	1132	94%	75	6%
Ind. L.J./1998	928	884	95%	44	5%
Ind. L.J./2008	1063	959	90%	104	10%
Iowa L. Rev. / 1998	987	921	93%	66	7%
Iowa L. Rev. / 2008	1357	1263	93%	94	7%
Mich. L. Rev./1998	3151	2857	91%	294	9%
Mich. L. Rev./2008	3602	3172	88%	430	12%
Minn. L. Rev./1998	1337	1190	89%	147	11%
Minn. L. Rev./2008	1688	1447	86%	241	14%
Nw. U. L. Rev./1998	1317	1201	91%	116	9%
Nw. U. L. Rev./2008	1939	1769	91%	170	9%
Notre Dame L. Rev./1998	837	803	96%	34	4%
Notre Dame L. Rev./2008	1417	1372	97%	45	3%
U. Chi. L. Rev./1998	2538	2293	90%	245	10%
U. Chi. L. Rev./2008	3071	2680	87%	391	13%
UCLA L. Rev./1998	1570	1532	98%	38	2%
UCLA L. Rev./2008	2032	1916	94%	116	6%
Vand. L. Rev./1998	1536	1417	92%	119	8%
Vand. L. Rev./2008	1837	1716	93%	121	7%
Wis. L. Rev./1998	1112	1040	94%	72	6%
Wis. L. Rev./2008	1085	971	89%	114	11%
Wm. & Mary L. Rev./1998	845	837	99%	8	1%
Wm. & Mary L. Rev./2008	1215	1192	98%	23	2%

similar (e.g., 3%/97% for the 2008 *American University Law Review* and 11%/89% for the 1998 *Minnesota Law Review*).

¶22 Because we compiled the data by decade, the results also show how citation rates break down among the three decades preceding the article’s publication. In 1998, 62% of citations were to material less than ten years old, 26% were to ten-to-nineteen-year-old material, and 6% to twenty-to-twenty-nine year-old material. In 2008, these percentages changed somewhat; 52% of citations were to material less than ten years old, 28% were to ten-to-nineteen-year-old material, and 13% to twenty-to-twenty-nine-year-old material. Although further study is warranted, it is interesting to note that the most recent material was cited less frequently in 2008 while twenty-to-twenty-nine-year-old material was cited more frequently. Table 3 shows citation rates for articles less than thirty years old.

Table 3

Age of Citations by Decade for Three Prior Decades: 1998 and 2008

Journal Year	Percentage of Citations by Age		
	0–9 years old	10–19 years old	20–29 years old
1998	62%	26%	6%
2008	52%	28%	13%

Analysis of Results

¶23 Based on the data gathered through this bibliometric analysis, it would appear that there has been no HeinOnline influence on selection of materials being cited. In other words, online access to the full text of older journal articles through HeinOnline has not increased their citation rates.

¶24 It is possible that this is a result of the fact that in 2006 and 2007 (when articles published in 2008 were likely to be researched), researchers were more likely to use HeinOnline as part of a two-step process (identifying citations in another source, such as ILP or another article’s footnote, and then retrieving through HeinOnline), rather than starting searching directly in HeinOnline. This premise, however, is based only on personal experience and our assessment that, in 2006 and 2007, HeinOnline’s search function was not nearly as easy to use as those of ILP, LegalTrac, or LexisNexis/Westlaw, or as easy as it is now.⁴⁹

¶25 If researchers in 2006 and 2007 were primarily using HeinOnline to obtain articles already located elsewhere, would the pattern change if more users started their research in HeinOnline—a distinct possibility as its search capabilities continue to become more robust? In other words, would citations to older materials increase if both citation and full-text were retrieved in a single search? Although

49. One researcher publishing in 2008 also noted this discrepancy in search sophistication, although she was using the HeinOnline Federal Register library, not the law journal library. See Katie R. Eyer, *Administrative Adjudication and the Rule of Law*, 60 ADMIN. L. REV. 647, 705 (2008).

this study cannot answer that question, the data can be parsed to at least glance at the issue.

¶26 Reducing the cut-off point between newer and older articles from three to two decades means that in the 2008 sample some older (1989 or earlier) articles cited could have been obtained via LexisNexis or Westlaw, while in the 1998 sample all older (1979 or earlier) cited articles would have been located and retrieved in print. Whereas our three-decade comparison showed almost identical preferences for newer materials—93% for 2008 and 94% for 1998—the two-decade comparison shows an increase in the proportion of older articles being cited from 1998 to 2008. The 1998 data set cited to 12% older and 88% newer articles (3192 to 23,356 respectively), while the 2008 data set cited to 20% older and 80% newer articles (6735 to 26,858 respectively). This change is very statistically significant (*p*-value less than .01).⁵⁰

¶27 Moreover, previous studies on law review use also document similar preferences for newer materials at two other periods when all cited articles would be found and retrieved in print, as shown in table 4. Of the earlier studies looking at citation age, two provide data for comparable time periods, albeit from different randomly selected samples of articles. Maru’s study of 1972 data found that ninety-one percent of all citations were from the prior twenty years,⁵¹ and Leonard’s 1986 data showed eighty-seven percent of citations were from the prior twenty years.⁵² Although more study would be warranted, this might support the findings of both Rumsey and Joergensen that authors are more likely to cite what is easily available.⁵³

Table 4
Percentage of Citations by Article Age

Journal Year	Percentage of Citations by Age	
	Less than 20 years old (1972 and 1986 data include articles exactly 20 years old)	More than 20 years old (1998 and 2008 data include articles exactly 20 years old)
1972 (Maru)	91%	9%
1986 (Leonard)	87%	13%
1998	88%	12%
2008	80%	20%

50. Special thanks to Lisa Gardner, Associate Professor of Statistics at Drake University, for her help determining statistical significance.
51. Maru, *supra* note 24, at 247.
52. Leonard, *supra* note 16, at 205.
53. Joergensen, *supra* note 33, at 52–53; Rumsey, *supra* note 36, at 210–11.

¶28 There is a natural impulse to state that the lack of citations to older materials represents the Principle of Least Effort⁵⁴ or the Tyranny of the Available.⁵⁵ In fact, part of the motivation for this study came during an instructional session covering research sources for a seminar paper, when a student questioned why restricting secondary research in a database to full-text sources would not be the most efficient choice. We hypothesized that the relative ease of identifying articles in one database, such as Westlaw or LexisNexis, and accessing them in another, such as HeinOnline, would increase the rate of citation to older articles. However, our study did not find that convenient electronic access to law review articles thirty years old or older identified in a separate source increased their citation rate, indicating that mere availability may not be enough. Rather, researchers may want to exert even less effort than we hypothesized. They may be more likely to cite to older materials only if they find and obtain the article in a single step, as seen in our two-decade analysis.

¶29 Another reason for the preference for newer materials may be found in the study of law itself. Perhaps law operates more like the sciences in the citation of recent secondary material,⁵⁶ and less like the humanities, where older materials are cited more frequently.⁵⁷ This is especially true when authors are citing to law review articles, which act as a time-capsule of sorts, freezing the law as it was the day the author finished writing the article. It makes sense that researchers would be hesitant to use older materials, since updating them can be a tedious process.

Conclusion

¶30 Our study clearly shows that authors of law review articles remain far more likely to cite to articles that have been published fairly recently. But while online

54. The Principal of Least Effort is thoroughly discussed in the context of information-seeking behavior by Thomas Mann in his 1993 book *Library Research Models* and is mentioned by both Leiter and Joergensen as one possible reason for their results. THOMAS MANN, *LIBRARY RESEARCH MODELS* 91–101 (1993); Joergensen, *supra* note 33, at 53; Leiter, *supra* note 12, at 67.

55. See Marci Hoffman & Katherine Topulos, *Tyranny of the Available: Underrepresented Topics, Approaches, and Viewpoints*, 35 SYRACUSE J. INT'L L. & COM. 175 (2008). Hoffman & Topulos's discussion of the "tyranny of the available" was based on Karl Llewellyn's "threat of the available"—his observation that researchers would "mistake the merely available, the easily seen, for all there is to see." KARL N. LLEWELLYN, *Legal Tradition and Social Science Method: A Realist's Critique*, in JURISPRUDENCE: REALISM IN THEORY AND PRACTICE 82 (1962). See also Richard A. Danner, *Contemporary and Future Directions in American Legal Research: Responding to the Threat of the Available*, 31 INT'L J. LEGAL INFO. 179 (2003).

56. See, e.g., Broadus, *supra* note 14 (sociology); Ortega, *supra* note 14 (chemistry); Ming-Yueh Tsay, *Library Journal Use and Citation Age in Medical Science*, 55 J. DOCUMENTATION 543 (1999); Ming-Yueh Tsay, *Library Journal Use and Citation Half-Life in Medical Science*, 49 J. AM. SOC'Y INFO. SCI. 1283 (1998).

57. See, e.g., Baum et al., *supra* note 14, at 905 (stating that the half-life for citations in the *American Historical Review* is 42.5 years); Heinzkill, *supra* note 14 (English). See also Yorgo Pasadeos et al., *Influences on the Media Law Literature: A Divergence of Mass Communication Scholars and Legal Scholars?*, 11 COMM. L. & POL'Y 179, 194 (2006) (comparing media law articles in law reviews and mass communications journals and finding an average citation age of fifteen years for the law reviews, compared to twenty-seven years for the mass communications journals).

access to the full text of older articles through HeinOnline has not increased their citation rates, that should not be construed as an indication that full-text accessibility of older journals is not necessary. After all, according to our study, seven percent of all citations in 2008 were to journal articles that were more than three decades old.

¶31 And, while electronic access to older articles is important, it is of even greater importance that current law review articles be widely accessible. With declining acquisitions budgets and space constraints, few law libraries would be able to maintain access to the hundreds of law review articles published each year without electronic databases. For both of these purposes, resources like HeinOnline, which provide access to both older and current journals, are invaluable.

Appendix

Coverage Details for Journals Chosen for Analysis (as of April 2010)⁵⁸

Title	Westlaw Coverage	LexisNexis Coverage	HeinOnline Coverage
<i>American University Law Review</i>	Selected coverage begins with 1981 (vol. 31); Full coverage begins with 1982 (vol. 32)	From Fall 1982 through current; from vol. 32	Vols. 1–58 #5 (1952–2009) Title Varies: Vols. 1–5 (1952–56) as <i>American University Intramural Law Review</i> Title originally added to Hein: 2002
<i>Boston University Law Review</i>	Selected coverage begins with 1982 (vol. 62, no. 2); Full coverage begins with 1986 (vol. 66)	From November 1982, vol. 62 through current	Vols. 1–89 #3 (1921–2009) Title originally added to Hein: 2003
<i>Cornell Law Review</i>	Selected coverage begins with 1983 (vol. 68, no. 3); full coverage begins with 1985 (vol. 70, no. 5)	From November 1982 through current; from vol. 68	Vols. 1–94 #4 (1915–2009) Title Varies: Vols. 1–52 (1915–67) as <i>Cornell Law Quarterly</i> Title originally added to Hein: 2003
<i>Duke Law Journal</i>	Full coverage begins with 1981 (vol. 1981)	From September 1982 through current	Vols. 1–58 (1951–2009) Title Varies: Vols. 1–6 (1951–57) as <i>Duke Bar Journal</i> Title originally added to Hein: 2001
<i>Emory Law Journal</i>	Full coverage begins with 1982 (vol. 31)	From Fall 1982 through current; from vol. 31	Vols. 1–59 #1 (1952–2009) Title Varies: Vols. 1–22 #2 (1952–73) as <i>Journal of Public Law</i> Title originally added to Hein: 2002
<i>Florida Law Review</i>	Selected coverage begins with 1983 (vol. 35); full coverage begins with 1993 (vol. 45)	From Fall 1993 through current; from vol. 45	Vols. 1–60 (1948–2007/2008) Title Varies: Vols. 1–40 (1948–88) as <i>University of Florida Law Review</i> Title originally added to Hein: 2003
<i>Fordham Law Review</i>	Full coverage begins with 1982 (vol. 50, no. 4)	From October 1982 through current; from vol. 51	Vols. 1–78 #2 (1914–17, 1935–2009) Title originally added to Hein: 2002
<i>Georgetown Law Journal</i>	Selected coverage begins with 1983 (vol. 71, no. 2); full coverage begins with 1985 (vol. 73, no. 3)	From October 1982 through current	Vols. 1–6, 8–95 (1912–2007) (Volume 7 never published) Title originally added to Hein: 2001
<i>Hastings Law Journal</i>	Full coverage begins with 1982 (vol. 33, no. 3)	From September 1982 through current; from vol. 34	Vols. 1–60 (1949–2009) Vol. 1 was <i>The Hastings Journal</i> Title originally added to Hein: 2002

58. Coverage details for LexisNexis and Westlaw are taken verbatim from their web sites. Dates journals were added to HeinOnline were provided by the company. E-mail from Marcie Baranich, *supra* note 40.

Title	Westlaw Coverage	LexisNexis Coverage	HeinOnline Coverage
<i>Indiana Law Journal</i>	Full coverage begins with 1982 (vol. 58)	From Winter 1982 through current; from vol. 58	Vols. 1–84 (1926–2009) Title originally added to Hein: 2003
<i>Iowa Law Review</i>	Selected coverage begins with 1982 (vol. 68); full coverage begins with 1985 (vol. 71)	From October 1982 through current; from vol. 68	Vols. 1–94 #4 (1915–2009) Title Varies: Vols. 1–10 (1915–25) as <i>Iowa Law Bulletin</i> Title originally added to Hein: 2001
<i>Michigan Law Review</i>	Selected coverage begins with 1982 (vol. 80, no. 5); full coverage begins with 1985 (vol. 84)	From October 1982 through current; from vol. 51	Vols. 1–108 #3 (1902–2009) Title originally added to Hein: 2000
<i>Minnesota Law Review</i>	Selected coverage begins with 1983 (vol. 67, no. 4); full coverage begins with 1985 (vol. 69, no. 4)	From October 1982 through current; from vol. 67	Vols. 1–93 (1917–2009) Title originally added to Hein: 2002
<i>Northwestern University Law Review</i>	Selected coverage begins with 1982 (vol. 76, no. 6); full coverage begins with 1984 (vol. 79, no. 4)	From March 1985 through current; from vol. 80	Vols. 1–101 (1906–2007) Title Varies: Vols. 1–46 (1906–52) as <i>Illinois Law Review</i> Title originally added to Hein: 2000
<i>Notre Dame Law Review</i>	Selected coverage begins with 1981 (vol. 57); full coverage begins with 1983 (vol. 59)	From 1982 through current; from vol. 58	Vols. 1–85 #1 (1925–2009) Title Varies: Vols. 1–57 (1925–82) as <i>Notre Dame Lawyer</i> Title originally added to Hein: 2000
<i>UCLA Law Review</i>	Full coverage begins with 1982 (vol. 30)	From October 1982 through current; from vol. 30	Vols. 1–56 #4 (1953–2009) Title originally added to Hein: 2003
<i>University of Chicago Law Review</i>	Full coverage begins with 1982 (vol. 49)	From Spring 1982 through current; from vol. 49	Vols. 1–76 #3 (1933–2009) Title originally added to Hein: 2001
<i>Vanderbilt Law Review</i>	Selected coverage begins with 1981 (vol. 34); full coverage begins with 1984 (vol. 37, no. 5)	From October 1982 through current; from vol. 35	Vols. 1–61 (1947–2008) Title originally added to Hein: 2001
<i>William & Mary Law Review</i>	Full coverage begins with 1981 (vol. 23)	From Fall 1982 through current; from vol. 24	Vols. 1–50 (1957–2009); Supersedes <i>William & Mary Review of Virginia Law</i> —Vols. 1–2 (1948–56) Title originally added to Hein: 2003
<i>Wisconsin Law Review</i>	Selected coverage begins with 1981 (vol. 1981); full coverage begins with 1985 (vol. 1985)	From January/February 1982 through current	Vols. 1–12, 1938–2009 #3 (1920–2009) Title originally added to Hein: 2003